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**Book Review:**

Exposure Assessment in Occupational and Environmental Epidemiology.

Mark J. Nieuwenhuijsen (Editor).

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**Review Authors:**

KENNETH MUIR and HOLLY BLAKE

Division of Epidemiology and Public Health, School of Community Health Sciences, University of Nottingham Medical School, Nottingham, UK

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An accurate measure of exposure is crucial for epidemiological research which attempts to relate exposure to external agents with the occurrence of particular diseases. The aim of this book is to increase our knowledge and understanding of exposure assessment methods and how they can be applied in occupational and environmental epidemiology.

In the light of the recent and rapid expansion of the field of occupational and environmental epidemiology and health risk assessment, this book provides a timely focus on both exposure assessment methods. This is probably the first textbook that explicitly tries to bridge the gap between the fields of occupational and environmental exposure assessment. This book assembles expert knowledge from diverse disciplines, including engineering, statistics, toxicology and environmental science, in an attempt to generate some coherence in the application of these methods to epidemiological research. In addition, it provides a number of cases studies of current topical research in the exposure assessment of allergens, particulate matter, chlorination disinfection by-products, agricultural pesticides and radio frequencies.

The overall impression is a positive one as the book incorporates contributions from recognized experts in occupational and environmental epidemiological studies. The book covers the methodology of exposure assessment including questionnaires, environmental design and modelling, personal/dermal exposure and exposure surrogates, biological monitoring and design issues of exposure measurement, including measurement error and the consequences. The second half of the book covers the current status of the application of these methods and current research questions.

The structure of the book is logical and coherent and a useful reference for those with a

specialist interest in this field. Perhaps those looking for a more general textbook might be referred to the Principles and Exposure Measurement in Epidemiology by Armstrong, White and Sarracci. Armstrong's text provides a solid grounding for those involved in the design or conduct of epidemiological studies and has served well as a text for those undertaking graduate courses in epidemiology. It remains a broader publication and more strongly represents a textbook of principles. There are some evident overlaps between the two texts (e.g. chapters on questionnaires and exposure measurement error). Nieuwenhuijsen's text nevertheless provides an update from the decade that has passed since the publication of Armstrong's text.

In Nieuwenhuijsen's text, Chapter 7 by Wolfgang Ahrens and Patricia Stewart is particularly useful in addressing issues surrounding the accuracy, reliability and validity of information in any given study and the issues surrounding the accuracy of retrospective exposure assessment, with reference to the reconstruction of past exposure.

Chapter 16 by Mustafa Dosemeci, an author well recognized in his field, also provides a useful overview of subject and pesticide-specific exposure with regard to occupational epidemiology. Dosemeci reviews the procedures used to evaluate pesticide exposures in epidemiological studies of cancer, with a focus on the agricultural setting. In this chapter the author makes suggestions for future exposure assessment procedures, for example those which may allow the evaluation of relationships between an unlimited number of genetic susceptibility markers and the exposure under question, without losing the power of the study.

The book also addresses newer challenges not previously covered in textbooks of exposure measurement. For example, Chapter 17 by Martie van Tongeren and Philip Chadwick examines the relationship between radio frequency and electromagnetic radiation and cancer, a topic of increasing importance in the light of recent developments in telecommunications.

Nieuwenhuijsen's book touches upon Bayesian analysis, a statistical technique for population modelling. These methods are becoming increasingly popular and so it would be useful for future texts to review these methods in further detail. Additionally, future texts or a second volume might expand further on genetic markers of exposure and other biomarkers.

This book would certainly be of particular relevance to those with a specialist interest in exposure assessment in occupational and environmental epidemiology, rather than appealing to a wider audience of those working in the general field of epidemiology. It would also be of interest to those occupational hygienists with an interest in environmental issues.